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Dr. Leslie Thorne Thornes Compliments

The Clinical Significance of Sinus Arrythmia.

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By

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THE CLINICAL SIGNIFICANCE OF SINUS ARRYTHMIA.

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Since the invention of the polygraph and the electro-cardiograph, it has been possible to classify the irregularities of the heart's action, and to distinguish those which are of serious import from those which are comparatively harmless. Before the introduction of these instruments and the discovery of the nervo-muscular structures, forming the sino-auricular node and the auriculo-ventricular bundle and its branches, cardiac irregularity of any kind was always regarded with grave suspicion, for it was not then possible to differentiate with certainty between the various forms of irregularity.

The careful physician, knowing that he was treading on uncertain ground, had to be guarded in his prognosis and on the safe side in his treatment, in any case in which the normal regularity of the heart beat was affected. In consequence, many cases, especially amongst children, were condemned, unnecessarily, to a very restricted and unhealthy life.

The pendulum has now swung in the opposite direction, and many cardiologists maintain that certain irregularities, especially those which are due to vagus influence, can be disregarded, both from the point of view of prognosis and treatment. This attitude is the natural result of the realization that the teaching of the past on this subject was faulty, but it does not allow for the facts, that these new methods of investigation are of comparatively recent date, that the effects of cardiac irregularities are often not apparent for years after their development, and that they often lie dormant till some extra strain on the muscular or nervous system brings them suddenly into prominence.

The present war has demonstrated in numbers of cases that hearts supposed to be perfectly sound, and fulfilling their functions satisfactorily in the ordinary routine of life,

have broken down entirely under severe and unusual strain.

I am convinced, from observation of many cases in adults, especially young adults, that the presence of any kind of irregularity in the cardiac rhythm is not a normal condition, and that it should not be disregarded. In all cases in which it is present, a careful enquiry into the previous history, and a detailed examination of the heart, to ascertain the presence or absence of dilatation, should be made, before the sign of irregular rhythm is set aside as a matter of no importance. It stands to reason that an organ which is working irregularly, whatever form that irregularity may take, is not in as satisfactory a condition as one which maintains a regular rhythm.

During the last twelve months, I have had under my care a number of officers, mostly young men, who have been invalided from active service on account of cardiac breakdown, the result of the unusual strain and responsibility of life at the front. These patients, without exception, have been passed for service as physically sound, but, on careful enquiry, I have always obtained a history of former heart trouble, such as a strain in school athletics, necessitating a long rest, or an attack of rheumatic fever in childhood. I have been struck with the fact that, in the large majority of these cases, the only signs of abnormality of the heart present were slight cardiac dilatation and marked sinus arrythmia. The most prominent symptom has usually been a severe form of general debility and exhaustion, so that the patient has been quite incapable of any sustained effort, either of body or mind, despite the fact that he has usually had a period of entire rest from work of some months' duration. Under treatment, the cardiac dilatation has disappeared, the patient has recovered from the condition of exhaustion and debility, has been able to take moderate exercise with enjoyment, and gradually to resume his ordinary habits without any return of the sensation of collapse, that formerly accompanied any effort whatever. The sinus arrythmia has usually become less marked, but it has generally persisted to a certain degree, and I am, therefore, led to believe that this arrythmia was not a new development, but that it had probably been present for a long period.

The following cases of two young officers, whose hearts have broken down on active service, are illustrative of many

thers, and the polygraph tracings show no abnormality, except a marked sinus arrythmia; the hearts in both cases were somewhat dilated.

Case 1.—Captain J., age 21 years, was sent to me on March 20, 916, by Dr. Arthur P. Luff, who informed me that the patient had een under his care, taking heart tonics and resting from work, since anuary 26, 1916, and that, as his cardiac condition did not improve narkedly, he had advised a course of "Nauheim" baths.

The history of the case is as follows:—At eleven years of age e suffered from severe dilatation of the heart, after a seven miles' aper-chase, was in bed 8 weeks, and not allowed to play any games or three years. In July, 1915, he suffered from severe shell concussion in France, was laid up in hospital for seven weeks, and then ut on light duty; since that time he has had seven medical boards, nd has always been reported as only fit for light duty. In December, 915, while out shooting, he was attacked with vertigo, collapse, and yncope, and shortly after this he consulted Dr. Luff.

When I first saw the patient, on March 23, 1916, he looked in good ealth, his pulse, in the recumbent position, was 88, and, in the erect, 12 per minute, and was of marked sinus arrythmia; his blood-pressure was 70–150 mm. Hg.; a blowing systolic murmur was heard over he aortic area, on lying down, but was not heard in the erect position, nd the first sound at the apex was reduplicated. The apex-beat was orcible, and just inside the left nipple line; the area of cardiac dullness extended from just inside the left nipple to nearly one inch to he right of the mid-sternal line, and measured nearly 4 inches across t the nipple level. A polygraph tracing, Fig. 1, showed a pulse of oor volume and of very marked sinus arrythmia, the largest waves measuring 15 millimetres, as compared to 8 millimetres of the shortest. t will be seen from the tracing that the $a - c$ interval is normal nd that the "*b*" wave is well marked in the long waves. The "*b*" wave is caused by diastolic closure of the auriculo-ventricular alves at the end of the ventricular filling, the flow from auricle to entricle is suddenly checked, and a reflex occurs into the jugular ein—the "*b*" wave.*

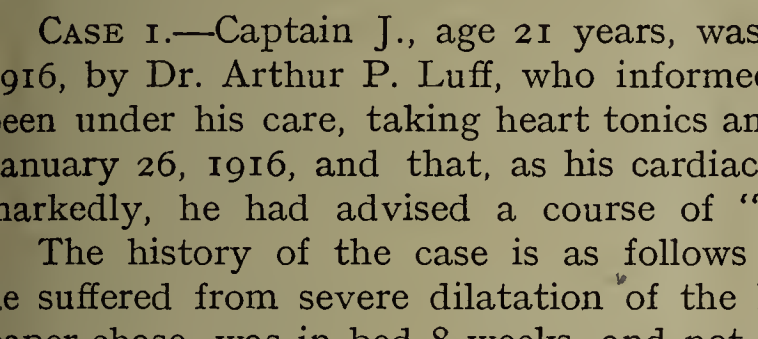

Fig. 1.—*Polygraphic tracing before treatment, showing very marked sinus arrythmia and a pulse of poor volume* (*Case* 1).

After a course of 25 "Nauheim" baths, the patient felt well, ad lost the feeling of exhaustion, and was able to take exercise with njoyment. The polygraphic tracing, Fig. 2, taken after treatment,

* Explanation of "*b*" wave. *Quarterly Journal of Medicine*, Dr. T. Davenport-Windle.

shows a pulse of improved volume, but the sinus arrythmia is sti present, as well as the "*b*" wave, in the longer waves. The area c cardiac dullness was normal, measuring about two and a half inche across at the nipple level. The blood-pressure was 50–115 Mm. Hg as compared to 70–150 Mm. Hg. before treatment.

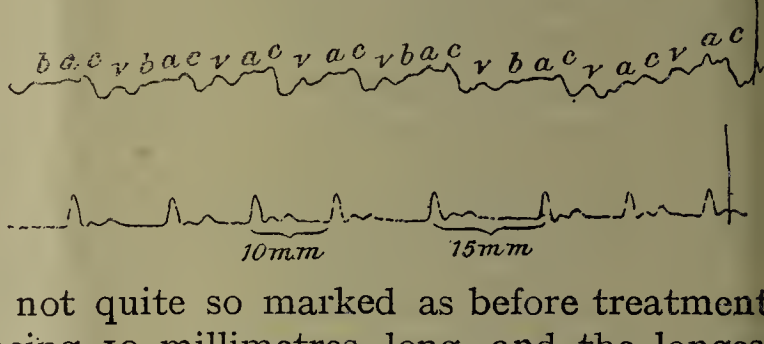

FIG. 2.—*Polygraphic tracing, showing improved volume of the pulse, but persistent sinus arrythmia* (*Case* 1).

The sinus arrythmia is not quite so marked as before treatment the shortest pulse waves being 10 millimetres long, and the longes 15 millimetres, as compared with 8 and 15 before treatment; it wa also not so constant.

CASE 2.—Captain L., age 30 years, consulted me in March, 1916 He had scarlet fever in 1907, followed by rheumatic fever. O December 28, 1915, he suffered from severe shell shock, followed b an attack of rheumatism early in January, 1916; since which tim he had been laid up entirely. When I first saw the patient, he looke pale and flabby, he was incapable of any exertion, and could onl move about his bedroom with the aid of two sticks, for the left le and thigh were very stiff from rheumatism, and any movement caused palpitation. The area of cardiac dullness was enlarged, measurin five inches across at the nipple level, and extending from just inside th left nipple to the right border of the sternum; the apex-beat wa just felt in the nipple line, the cardiac sounds were weak, but n murmur was present; the pulse was 96 per minute in the prone posi tion, and 108 in the erect; the blood-pressure was 70–105 Mm. Hg A polygraphic tracing, Fig. 3, showed a pulse of poor volume and of marked sinus arrythmia, the longest wave measuring 13 millimetres and the shortest 8 millimetres. The patient had been in bed fo 2 months, and had had several weeks' massage, with only slight improvement of the stiffened limb; he was stiff in his neck and back, but there were no joint lesions.

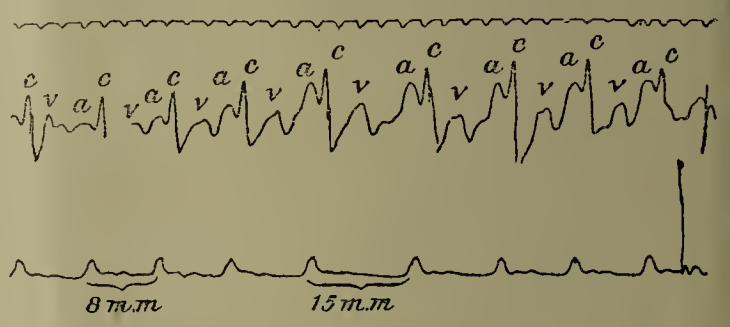

FIG. 3.—*Polygraphic tracing before treatment, showing sinus arrythmia and poor volume of pulse* (*Case* 2).

I advised a course of modified "Nauheim" baths, resembling the "Nauheim" baths in constituents, but at a higher temperature, on account of the rheumatism, and he went into a nursing home for that purpose. After a course of twenty-five baths, extending over

ve weeks, he could walk about comfortably, without sticks, but ith a slight limp. The area of cardiac dullness was normal, measuring bout two inches across on the nipple level, and the apex-beat was ne inch inside the nipple line; the rate of the pulse was 80 in the one position and 92 in the upright position. The blood pressure as unaltered. The polygraph tracing, Fig. 4, shows a pulse of ower rhythm and improved volume. The sinus arrythmia is still esent, but is not so marked, the longest wave being 13 millimetres, d the shortest 11 millimetres, as compared to 8 and 13 millimetres fore treatment.

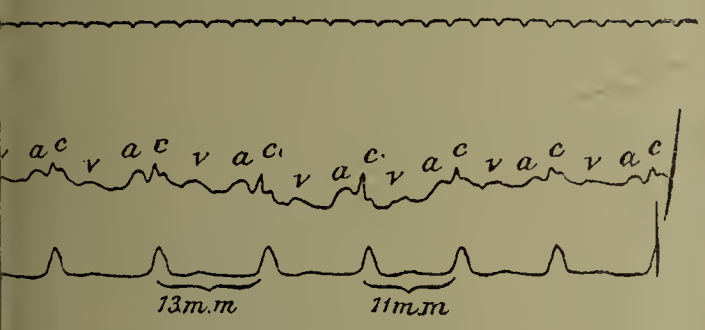

FIG. 4.—*Polygraphic tracing after treatment, showing pulse of improved volume and slower rate, the sinus arrythmia being still present in a less degree (Case 2).*

The above cases are only two examples of many that have me under my notice, from the treatment and observation which I have formed the following conclusions:—

1. The presence of sinus arrythmia, which indicates an irregular cardiac dilatation, is not an absolutely normal phenomenon.
2. People in whom this arrythmia is present are more liable to suffer from a cardiac breakdown, under mental or physical strain, than are those who have a perfectly regular pulse.
3. Any soldier who has had a cardiac breakdown, and whose pulse shows evidence of sinus arrythmia, is not fit for active service abroad.

TREATMENT.

Absolute rest, except in the acute stage of the breakdown, not advisable. When the patient is able to get about at ll, he should take as much walking exercise a day as he can o without feeling done-up. A course of mineral baths, milar to those originally given at "Nauheim," should be rescribed, and, in some cases, massage is also useful. Drugs eem to be of little or no use in these cases, after a certain tage.

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